The Office of Biological and Environmental Research (BER) of the Office Science, U.S. Department of Energy is pleased to announce winners of the first BER Distinguished Scientist Fellowship competition. These Distinguished Fellows will help advance and sustain scientific excellence in biological and environmental research at the National Laboratories. Each of BER's four divisions, Climate Change Research, Environmental Remediation Sciences, Life Sciences, and Medical Sciences, is honoring one scientist.

Each Fellow will receive $250,000 per year for up to five years contingent on their continued employment at the National Laboratory at which they received the award. Selections were made following external peer review of applications based on: evidence of sustained scientific excellence; significant scientific achievements; honors and awards; quality of peer-reviewed publications in high impact journals; number of publications; research relevance to programmatic goals in BER; and recommendations from individuals at non-affiliated institutions.

The Medical Sciences Distinguished Fellow is Dr. Joanna Fowler, a Senior Scientist at Brookhaven National Laboratory. Dr. Fowler began her distinguished career at Brookhaven as a post-doctoral fellow. Her research has led to fundamental new knowledge, important scientific tools and broad impact in the application of nuclear medicine to diagnostics and health. Her sustained scientific excellence and significant achievements have been recognized by a number of prestigious awards including the American Chemical Society's Garvan-Olin Medal, the Society of Nuclear Medicine's Paul Aebersold Award, DOE's E. O. Lawrence Award in Life Sciences, the American Chemical Society's Glen T. Seaborg Award, and election to the National Academies of Science in 2004.

Dr. Fowler's specific scientific accomplishments are many and include the following:

- She played a central role in the breakthrough leading to the development of a fluorine-18, positron emitter-labeled glucose molecule enabling human brain glucose metabolism to be measured noninvasively. This molecule, together with Positron Emission Tomography (PET) has become a mainstay for brain imaging studies in schizophrenia, aging and cancer.
- Her interest in monoamine oxidase (MAO), one of the two major enzymes involved in neurotransmitter regulation in the brain and peripheral organs, led her to develop the first radiotracers for imaging MAO in the human brain that led to insights into the neurochemistry and treatment of depression and Parkinson's disease.
- Dr. Fowler's landmark studies on MAO included the discovery that smokers, but not former smokers, have reduced brain MAO type B, which may be relevant to the low rate of Parkinson's disease in smokers and the high rate of smoking among populations with clinical depression and addiction to other substances.
- Most recently Dr. Fowler has launched a program using brain imaging to understand the mechanisms underlying drug addiction and is engaged in

developing methods to understand the relationship between genes, brain chemistry and behavior.

The Life Sciences Distinguished Fellow is Dr. Mina Bissell of Lawrence Berkeley National Laboratory. Dr Bissell has made pioneering scientific contributions in molecular cell biology in general, and in the fields of extracellular matrix and breast cancer research in particular. She has been effective as a leader, teacher, mentor and national spokesperson for scientific issues of fundamental importance. She is the recipient of numerous national and international awards including Milton Fellow, Fogarty Fellow, Guggenheim Award, Fellow AAAS, Institute of Medicine Fellow, DOE Ernest Orlando Lawrence award, Mellon award, Eli/Lilly/Clowes award.

Dr. Bissell has contributed significantly to the mission of the DOE Office of Science during more than two decades of service, with exceptional achievements that include:

- Demonstrated role of extracellular matrix and cellular architecture in suppression of the tumor-forming action of even the potent $PP60^{src}$ oncogene of Rous Sarcoma Virus. Her research showed that the presence of the viral gene alone was not sufficient to cause tumors, but required the convergent actions of defective matrix signals and tissue destruction. Her elucidation of specific tissue and matrix factors is resulting in novel, antibody-based treatments for malignant breast cancer.

- Demonstrated cross-talk between the genome and the extracellular matrix, showing that small insoluble molecules in the matrix can direct the shape of a cell, alter its gene expression, and even determine its malignancy. She was the first to provide a direct molecular target for the action of the extracellular matrix, by identifying the first extracellular matrix response element in the promoter of a milk protein gene, and its cognate interacting transcription factors.

- Developed 3 dimension organotypic (rather than conventional 2 dimensional flat) cell/tissue culture models that rapidly distinguish normal and malignant breast tissue cells. This emerging work should lead to the more accurate and early detection of malignant breast cancers.

The Environmental Remediation Sciences Distinguished Fellow is Dr Terry Hazen at Lawrence Berkeley National Laboratory. Dr. Hazen has worked within the DOE system for 20 years including at Savannah River National Laboratory and Savannah River Ecology Laboratory. He is has conducted pioneering research on the bioremediation of solvents and metals, that is expected to play a critical role in the cleanup of DOE legacy wastes.

Dr. Hazen's research and technological achievements range from environmental ecology to infectious disease ecology, including:

- Demonstrated the utility of a gaseous nutrient injection into the subsurface that resulted in the bioremediation of chlorinated solvents and fuels. This biostimulation process has been successfully used at over 150 contaminated sites.

- Developed molecular gene probes to monitor microbial communities, from organic-decontaminating methanotrophs to human pathogen indicator organisms.

- Initiated the Deep Subsurface Microbiology program at DOE's Savannah River Site, focused on understanding microbial ecology under extreme environmental conditions. This work, which led to the development of BER's Natural and Accelerated Bioremediation research (NABIR) program to support new research underpinning the development of new strategies for cleanup of contaminated DOE sites, has implications that reach beyond cleanup to evolution and the sustainability of life on other planets.

The Climate Change Research Distinguished Fellow is Dr. Ben Santer of Lawrence Livermore National Laboratory. Dr. Santer is one of the world's leading scientists in the identification of human caused climate change in both observations and climate model simulations. His work is marked by its depth and insight and he is known for thoroughly exhausting all avenues in his pursuit of a solid answer or conclusion. Dr. Santer's work has been widely recognized by the scientific community through numerous awards and honors, including the prestigious MacArthur Fellowship.

The impact of Dr. Santer's two decades of study using observational records and climate model simulations to characterize climate change is evidenced by these achievements:

- His pioneering use of novel pattern statistical techniques, called "fingerprint detection" methods, to objectively compare the geographic distribution of surface temperature records with human-induced aerosol particle generation critically linking the impact of human activity on climate change.

- Analysis of tropospheric temperatures and the height of the stratosphere-troposphere boundary, showing accurate model simulation of climate change only upon inclusion of radiative forcing from human activities.

- Dr. Santer's contribution to the periodic Scientific Assessments Reports of the Intergovernmental Panel on Climate Change (IPCC).

These four BER Distinguished Fellows will receive their first funding in FY 2006.

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